RICHMOND NATIONAL BATTLEFIELD PARK
VIRGINIA

ENVIRONMENTAL ASSESSMENT
For the
GAINES' MILL CULTURAL LANDSCAPE RESTORATION

I. PURPOSE AND NEED

Richmond National Battlefield Park (RNBP) of the National Park Service (NPS), Department of the Interior (DOI), proposes to remove approximately 7.8 acres of forest vegetation in order to restore this acreage to its historically accurate condition (in 1862) at the park's Gaines' Mill battlefield unit. This Environmental Assessment (EA) explores the specific issues of manually clearing mid-successional (50-70 years old) forest vegetation from approximately 7.8 acres and converting it to a tall, native grass field similar to the 1862 historic battlefield conditions.

Map 1 locates RNBP and its environs. Map 2 indicates the Gaines' Mill area and clearing locations. The areas of the planned clearing are two upland sections of the unit's main forest, and are adjacent to agricultural and managed fields.

This EA is mandated by the National Environmental Policy Act (NEPA) and is in accordance with both NPS and park policies. These actions are in compliance with Section 106 of the Antiquities Act, and are supported by an historic study document: the Gaines' Mill Cultural Landscape Report and Archaeological Survey (CLR), completed in July 1999. Other supporting documents include the park's General Management Plan, Resource Management Plan, and various interpretive plans. (All of these plans are available by calling park headquarters at 804-226-1981, or through the park's Natural Resource Management Specialist at 804-795-5019.)

SYNOPSIS:

The primary management objective of the NPS at Gaines' Mill are to develop a cultural landscape representative of the 1862 battle, while protecting the unit's cultural and natural resources. This EA will specifically cover the limited action of manual vegetation clearing, and meadow creation on approximately 7.8 acres of upland property near the historic Watt House (Map #2). The purpose of the proposed clearing is to help convert the current forested landscape to one that better simulates the actual battlefield conditions of 1862. The resulting field will consist of native grass species and will be maintained by annually bush hogging. The proposed action will not affect rare, threatened or endangered species, wetlands or watersheds, and will not produce sedimentation. It will provide for increased interpretation and create an expanse of meadow habitat, which is relatively uncommon in this part of the country.

II. AFFECTED ENVIRONMENT

A. Description of Richmond National Battlefield Park

RNBP is located 110 miles south of Washington, D.C., in and near the city of Richmond, Virginia. The park and the city lie along the transition (fall line) between the Tidewater and the Piedmont regions between the James and York rivers. Located at the junction of Interstates 64 and 95, the city of Richmond is a major commercial and cultural center in the Mid-Atlantic region. The park contains over 1402 acres in 10 individual units spread out over a 132-square mile area. The Chimborazo Park unit contains a visitor center and administrative offices and is the only park owned unit within the city of Richmond. The remaining units lie north, east, and south of the city, in Chesterfield, Hanover, and Henrico counties, approximately 8 to 15 miles from the main visitor center. All units are in the 3rd and 7th Congressional Districts as reconfigured after the 1990 census. Currently, the park sustains populations of white-tailed deer, turkey, bobcat, opossum, raccoon, skunk, gray fox, and eastern cottontail, among numerous others.

Gaines' Mill:

The Gaines' Mill unit is located in eastern Hanover County, Virginia, 5 miles southeast of Mechanicsville (Map #1). This 59.7-acre unit of the park is situated on the southern bank of Boatswain Creek. This is generally a small tributary of the Chickahominy River, although fairly recent beaver activity has created several impoundments along the creek. It has been found to harbor ten species of freshwater fishes, including bluegill, largemouth bass, bluespotted sunfish, eastern mudminnow and eastern mosquitofish. Gaines' Mill is approximately one-half mile south of two-lane Virginia State Route 156 (Cold Harbor Road) at the end of Watt House Road near the community of New Cold Harbor. The unit is situated atop a plateau above the Chickahominy River corridor, which is located approximately 0.8 miles to the south.

The park area consists of a combination of yard grass, meadow and secondary and old growth timber habitats. Approximately 10 acres of mowed fields lie south of the main forest. The majority of these fields is presently managed as meadow and is bush-hogged once or twice per year, however approximately four acres is managed in yard grass and is mowed to approximately 4 inches every two weeks. One additional acre of invasive exotic forest vegetation on the Southeast boundary of the unit was cleared during the spring of 2002, and a two acre section of forest was removed adjacent to the proposed clearing area in 1999. These projects were described in detail in two prior Environmental Assessments, and all environmental effects associated with the proposed action are considered in combination with any effects caused by these past actions. The upland (up slope from the creek about 100 yards) secondary growth forest consists of hardwood-conifer forest community that appears to be approximately 50-70 years old. This community is dominated by sweetgum (*Liquidambar styraciflua*), tulip poplar (*Liriodendron tulipifera*), and loblolly pine (*Pinus taeda*) in the canopy, and such understory species as American holly (*Ilex opaca*), dogwood (*Cornus florida*), and red maple (*Acer rubrum*). The ground cover in this community consists primarily of such weedy species as poison ivy

(*Toxicodendron radicans*), muscadine grape (*Vitus rotundifolia*), Virginia creeper (*Parthenocissus quinquefolia*) and Japanese honeysuckle (*Lonicera japonica*). Historic documents, correspondence, and military reports, researched in the CLR process, indicate that this area was cleared during 1862. As the topography begins sloping towards Boatswain creek to the North (the unit's northern boundary), the forest community transitions to an older oak forest. A recent field visit by Virginia Division of Natural Heritage staff indicated that this portion of forest is an outstanding example of old growth Mesic Mixed Hardwood Forest. It is dominated in the canopy by white oak (Quercus alba), American beech (*Fagus grandifolia*) and American holly (*Ilex opaca*), and in the understory by American holly, black gum (*Nyssa sylvatica*) and highbush blueberry (*Vaccinium formosum*). The herbaceous layer is dominated by huckleberry (*Gaylussacia frondosa*) and muscadine grape. The Division of Natural Heritage recently surveyed this section of forest for the Federally-listed Endangered small whorled pogonia (*Isotria medeloides*), however the presence of this species was not found in the area. The park unit contains three intermittent streams running down the slope and into Boatswain Creek. One of which was recently inventoried for rare freshwater invertebrates, however none were found nor are likely due to the lack of permanent water in the seep.

The forested area to be cleared is within the upland Hardwood-Conifer community. It includes four soil types. They are primarily 0-7 percent slopes, consisting of Caroline-Dougue Complex, Kempsville-Bourne fine sandy loam, and Suffolk loamy fine sand (see Map Sheet 62; 13B2, 40B and 63B respectively in Soil Survey of Hanover Co., 1980). However a small section of the area to be cleared (<0.5 acres) is situated on Caroline-Dougue Complex at 7-15 percent slopes (see Map Sheet 62; 13C2 in Soil Survey of Hanover Co., 1980). All of these soils, with the exception of 13C2 are subject to moderate erosion if not managed properly. The 13C2 soils are highly susceptible to severe erosion, especially in the areas of greater slope. Their permeability is medium to slow and run-off is medium to rapid. All types are at least moderately well suited for pasture grass or hay, however low pH, organic matter content and fertility are major management problems. Although the area has some steep slopes (ravine-like), these are generally south of the affected area. National Wetland Inventory (NWI) maps, along with data gained from a recent USGS wetland delineation, indicate that the nearest wetland is located at least 400 feet north of the affected area. USGS Quadrangle maps indicate no perennial streams within approximately 400 feet. According to an ongoing mammal survey, the forest area supports typical fauna such as deer, raccoon, skunk, and small mammals such as chipmunk and pine voles. This area also supports typical forest bird species, however, the old growth forest community down slope has been found to support a unique cohort of spring migrations including several species of thrushes (Dana Bradshaw, personal communication). The Gaines' Mill Forest has also been found to harbor many species of reptiles and amphibians, such as the redback salamander, ringneck snakes, worm snakes, five-lined skinks, and several species of frogs (Joe Mitchell, personal communication). However, the down slope portion of the forest, because of its structure and proximity to Boatswain Creek, is considered optimal habitat for these and other reptile and amphibian species.

Replicating this historic landscape, and making this historic tree line more visible and its complement, the re-establishment of contiguous tall grass field conditions, are interpretive and cultural landscape goals for the park and area.

The area neighboring the park is generally characterized by open uplands in agricultural use, wooded stream corridors, and swampy bottomlands, which feed into the Chickahominy River, a tributary of the James River. Woodland areas consist primarily of secondary-growth, eastern deciduous species of the oak-hickory association. Crops traditionally raised in the area include wheat, corn, soybeans, and a variety of other truck farm vegetables. In recent decades, upland areas increasingly have been developed for suburban residential use. Several large agricultural tracts, which immediately adjoin the park to the east and northwest, provide some degree of buffering from residential development. The approach to the unit along Watt House Road, however, has experienced considerable suburbanization compared with thirty years ago.

The attached Map 1 locates RNBP and the Gaines' Mill unit. Maps 2 and 3 specifically identify the proposed area for clearing/restoration.

B. Neighboring Jurisdictions

The area surrounding Gaines' Mill is privately owned and under the jurisdiction of Hanover County.

C. Cultural Resources

The entire site is a cultural resource. Rifle pits and other soldier constructs exist in number. An Historic house, road traces, and out-building ruins also exist. The current landscape is different from that of 1862, though. The site is inherently archaeological in nature. All vegetation clearing will be restricted to the ground surface. All tree stumps will be ground down to a maximum depth of four (4) inches, to protect and leave undisturbed any archaeological resources. The 4-inch depth is the limitation placed upon the project by NPS and SHPO archaeologists.

In sum, the park is charged with preservation of cultural resources and the interpretive scene and is required to explore all potentially controversial actions involving the environment through the NEPA process. Therefore, this EA explores the specific issues of clearing and converting to field up to 7.8 acres at Gaines' Mill. We welcome input, concerns, questions, and possible solutions from the public. Please address all communications to the park's Natural Resource Management Specialist, Kristen Allen, at 804-795-5019.

III. ALTERNATIVES INCLUDING THE PROPOSED ACTION

A. CONVERSION TO FIELD OF 7.8 FORESTED ACRES AT GAINES' MILL **(PROPOSED ACTION)**

Forest vegetation will be removed from 7.8 acres of upland, up slope, primary/secondary growth forest. This will be accomplished by the mechanical removal of timber. This work will be done by contract and will consist of the contractor furnishing all labor, equipment, supplies, materials, machinery, and incidentals necessary for the clearing and removal of all woody vegetation (trees, bushes, etc.) from the designated acre. Stumps greater in diameter than 2" will be ground to a sub-surface depth not to exceed 4". Special care will be given not to damage, deface, destroy, or remove any historic objects, entrenchments, signs, unmarked trees, survey monuments, witness corners, reference monuments, roads, or other property. Upon completion of the clearing, warm-season native grass species, along with an annual nurse crop will be planted at the earliest possible and practical time. If seeding is delayed due to bad weather or otherwise, anti-erosion measures will be made. Anti-erosion matting, or a cover such as "soil guard matrix", will be put in place. Repeated herbicide treatment of sprouting exotic vegetation may be required. However, it will be limited by the combined mechanical treatment of annual bush hogging, and only non-restricted, NPS approved herbicides will be used (preferred environmental alternative).

To further reduce any possible damage:

- All equipment used in the operation will have rubber tires. No tract type tractors will be permitted in the area at any time.
- Due care will be taken to avoid damage to other trees not to be removed, including any identified specimen trees.
- Erosion Prevention – All operations shall be conducted reasonably to minimize soil disturbance and/or erosion. No work will be permitted on the site during periods where rain accumulation exceeds ¼ ".
- No new roads will be constructed and/or needed to implement the proposed action.
- Where necessary, water will be used to control dust.
- Care will be taken to avoid the spread or establishment of exotics along new timber/field margins. This will be accomplished by regular treatment of exotics within the forest using non-toxic glyphosate herbicide.

This action will:

- increase the available cultural landscape by establishing a tall grass field similar to 1862 conditions (Gaines' Mill CLR, 1999).
- increase visitor understanding, interpretation, and knowledge of the area, thereby allowing for increased visibility of battle terrain. This in turn will allow for greater interpretation of the strategies and war time conditions represented therein (CLR,1999).
- provide for a tall, native grass habitat. The resulting tall, native grass field will provide increased habitat for ground birds, such as grouse, and small mammals, such as meadow voles. This habitat is rare in suburban, agriculture, and/or wood lot habitats of the area and, therefore, will be of increased value.

- not adversely impact rare, threatened, or endangered species. A recent investigation by the VA Division of Natural Heritage indicated no RT&E species would be affected.
- not impact wetlands or floodplains. NWI maps and USGS quadrangle maps indicate that there are no wetlands or perennial streams within approximately 1,000 feet of the affected area. Therefore, there can be no significant impact on wetlands/floodplains.
- avoid damage to surrounding forest areas by clearly marking those areas for protection.
- be in compliance with the Chesapeake Bay Protection Act.
- protect the old growth forest community by providing at least a 200 foot forested buffer between it and the area of clearing.
- avoid clearing on highly erodeable soils.
- provide at least a 100 foot forested buffer between the area of clearing and any intermittent tributaries of Boatswain Creek.

ALTERNATIVES CONSIDERED BUT REJECTED:

B. NO-ACTION ALTERNATIVE:

The no-action alternative of continuing to maintain the non-historic forest will not allow for the establishment of the desired battlefield cultural landscape as recommended by the CLR. This will prevent the park from furthering its goal of restoration to near battle conditions and increasing visitor understanding. This action will allow the continued growth of secondary growth forest. Current steep slope, hydrological, soil, RT&E species, wetland/floodplain, and wildlife conditions will be unchanged. No new beneficial tall native grass habitats will be created.

C. REMOVAL OF ADDITONAL FOREST ACREAGE AND FOREST ALTERATION AS PRESCRIBED IN THE CULTURAL LANDSCAPE REPORT

The removal of 20 additional acres of forest and the re-creation of field conditions are specified in the unit's CLR as the recommended cultural landscape objectives for the Gaines' Mill unit. This would include clearing in all areas outside of the old growth community (See map #3) leaving no buffer between this community and the disturbed area. Also recommended in the CLR is the understory clearing and "limbing up" of trees within approximately 5 acres of old growth forest. This proposal would require levels of funding that are unavailable at this time, and there are several environmental concerns associated with this option (described below). The preferred option is a compromise between restoring the cultural landscape, while protecting the exemplary natural resources found at this unit.

Concerns:

- <u>Soils and Erosion:</u> The area in question for removal under this alternative, between the preferred action and the historic tree line lies on soils consisting

solely of Caroline-Dougue Complex at 7-15 percent slopes (See 13C2 in the Soil Survey of Hanover County, 1980). This soil is highly susceptible to severe erosion, especially in the areas of greater slope as are found in many sections of this ravine. The area designated for understory clearing lies on soils consisting of Udults-Ochrcrepts complex (See 70D in the Soil Survey of Hanover County, 1980). Soil erosion is a very severe hazard on these soils due to rapid run-off and low permeability. Although large trees would be left under this option, understory clearing is likely to open up areas of bare soil, therefore resulting in erosion.

- Hydrology: Up to three small intermittent streams have been found running down the ravine and into Boatswain Creek. This alternative would involve removing sections of riparian buffer from the upper portions of these streams, and removing understory along the entire length of one of the streams.

- RT&E species/communities: This alternative would provide no buffer between the old growth community and the disturbed area, and has the potential to degrade this valuable community. This would be greatly compounded by the fragmentation resulting from understory clearing within the forest.

- Exotic/invasive vegetation: This action will remove existing exotics from the forest margins. However, it will open up additional forest margins, as well as the forest interior to infestation. The lack of forest buffer between the old growth forest community and the disturbed area, when combined with the understory clearing within the forest, would greatly increase the likelihood of degradation by allowing exotics to colonize the area.

D. REMOVAL OF ADDITIONAL FOREST ACREAGE TO MORE CLOSELY REPLICATE THE HISTORIC SCENE

The removal of 20 additional acres of forest and the re-creation of field conditions are specified in the unit's CLR as recommended cultural landscape objectives for the Gaines' Mill unit. Again, this would include clearing in all areas outside of the old growth community (See map #3) leaving no buffer between this community and the disturbed area. However, it would leave the forest interior intact. This alternative would include no understory clearing within the old growth forest as described in the CLR, and in Alternative C. This alternative was also rejected because it would require levels of funding that are unavailable at this time. Also, as described above, there are several environmental concerns associated with this option. The preferred option is a compromise between restoring the cultural landscape, while protecting the exemplary natural resources found at this unit.

E. THE PREFERRED ENVIRONMENTAL ALTERNATIVE

The preferred environmental alternative is the same as the preferred alternative. Creating tall native grass habitat is good for fauna and flora that currently have no such similar

habitat in the area. The surrounding area is predominantly composed of crop agriculture, with increasing suburban, single home development (with associated roads), apartment complexes, and strip malls. Native seed, along with an appropriate nurse crop, will be used to plant the field after the timber is removed. This grass will be maintained by bushhog on a frequency to maximize nesting animals and native seed production and spread, and to maintain cultural landscape visibility. This will generally be once yearly.

IV. ENVIRONMENTAL CONSEQUENCES

The proposed action (Alternative A) will go a long way to re-establish the cultural landscape for this park unit and increase visitor understanding and interpretation. As stated within each pertinent alternative, the loss of one acre of secondary growth forest habitat will not have a substantial effect on wetlands, floodplains, extant wildlife, or vegetation. The creation of grass areas will aid populations needing this area-rare habitat. The No Action alternative (Alternative B) will prevent cultural landscape restoration and decrease visitor understanding and interpretation, thereby preventing the park from meeting its mandated goal. The removal of additional forest acreage and forest alteration as prescribed in the Cultural landscape report (Alternative C) would completely restore the cultural landscape, therefore greatly increasing visitor understanding. However, the environmental concerns associated with this alternative may outweigh the benefits. The removal of additional forest acreage to more closely replicate the historic scene (Alternative D) will reduce fragmentation of the old growth forest, however the removal of all forested buffer from between the old growth forest and the disturbed area will also result in environmental concerns that may outweigh the benefits associated with restoring the cultural landscape. Finally, in actuality, the preferred environmental alternative (Alternative E) is the preferred alternative; the creation of a large, contiguous native grass meadow will be a tremendous boon to wildlife in an area where such habitat is very scarce.

A. CONVERSION TO FIELD OF 7 FORESTED ACRES AT GAINES' MILL **(PROPOSED ACTION)**

VISUAL or AESTHETICS

The proposed alternative will create areas that will be aesthetically unpleasing temporarily during and immediately following tree clearing. No cultural resources, such as trails, cannons or archaeological resources will be damaged. A landscape, more reminiscent of the Civil War period, will ultimately be created.

WILDLIFE

The proposed alternative will have a small effect on secondary growth forest habitat for small mammals and birds, however such habitat exists in abundance close by. The 200 foot forested buffer to be retained between the old growth forest and the disturbed area will provide protection for the unique bird community, as well as the rich reptile/amphibian community. The establishment of a large, contiguous native grass meadow will increase

habitat for field mammals, birds, and reptiles; and represents a habitat that is now non-existent in the area.

RARE, THREATENED, OR ENDANGERED SPECIES

According to a recent inventory of the Gaines' Mill unit, completed by the VA Division of Natural Heritage, the affected area has no known rare, threatened, or endangered (RT&E) species. The habitat proposed for clearing under this alternative is not unique to the area of the park or local community. This alternative also provides a 200 foot buffer from the adjacent old growth community (see above), in order to protect this community from encroaching invasive species.

CULTURAL

The proposed alternative will re-establish up to 7.8 acres of historic landscape as prescribed in the unit's Cultural Landscape Report. Care will be taken to prevent damage to cultural resources and will allow archeologists to better access the area, and stump grinding will only occur to a depth of four inches.

VISITOR USE

Under the proposed alternative there would be limited disruptive effects to visitors as tree clearing will occur adjacent to park trails, however the disruption will be limited to a few days. No throughways will be affected, and visitors will still be able to access the unit.

Tree clearing work will pose little safety concern to visitors as work areas will be patrolled and signed appropriately, and any tree felling concerns will be mitigated through the use of professional tree workers.

ECONOMIC

There will be an increase in the management costs associated with this area once it is cleared, however costs will be minimized by the fact that the resulting area will only be bush hogged once or twice per year.

AIRSHED

Except for an occasional, and temporary, dust cloud from a falling tree, tree clearing will have little effect on air quality.

SAFETY

Felling of trees is a concern (see Visitor Use), but one easily mitigated through the use of professional workers. The affected area will be signed and restricted to visitors as needed.

SOILS

Tree clearing will not occur on areas of erodeable soil, and forested buffers will remain between these areas and those to be cleared. Stumps will be grinded only to a depth of four inches in an effort to minimize soil disturbance. Overall soil disturbance during timber removal will be minimal. Techniques will emphasize non-disturbance, including a prohibition of all work activities when more than .25 inches of rain falls in a 24-hour period. Cleared areas will be re-vegetated as quickly as possible in full native grass coverage.

WATER RESOURCES

Under the proposed alternative, water quality impacts would be minimal or non-existent. All work is located up-slope, on relatively flat terrain, and away from any watercourses, wetlands, or steep ravines. However, the areas of clearing will be quickly reseeded with grasses to avoid soil sedimentation into water courses.

OVERALL PROGRAM RISK

The proposed alternative presents little risk. Erosion and encroachment of invasive species will be monitored and mitigated, if needed. In addition, a large forested buffer will be maintained between the area of clearing and the more unique natural resources found at this unit.

IMPAIRMENT

This action will not cause permanent and irreversible damage in any of the above impact topics. Impairment is not a concern under this alternative.

B. NO-ACTION ALTERNATIVE

VISUAL or AESTHETICS

The No-Action alternative will retain 7.8 acres of forest. No cultural resources, such as trails, cannons or archaeological resources will be damaged. A cultural landscape, reminiscent of the Civil War period, will not be created.

WILDLIFE

The No-Action alternative will have no immediate effect on small mammals and birds likely to inhabit secondary growth forest. Tall native grass habitat for field mammals, birds, and reptiles will not increase.

RARE, THREATENED, OR ENDANGERED SPECIES

The No-Action alternative will have no effect on any endangered species.

CULTURAL

The No-action alternative will have no effect on any cultural remains still existing in the area and the historical landscape will not be re-established.

VISITOR USE

Under the No-action alternative no historical landscape will be re-established, and visitors will not have an increased sense of the area during 1862.

ECONOMIC

This alternative will have no effect on economic resources.

AIRSHED

This alternative will have no effect on air quality.

SAFETY

This alternative can have no safety concerns.

SOILS

This alternative can have no effect on soils.

WATER RESOURCES

This alternative can have no effect on water resources.

OVERALL PROGRAM RISK

The No-action alternative presents little risk.

IMPAIRMENT

This action will not cause permanent and irreversible damage in any of the above impact topics. Impairment is not a concern under this alternative.

C. REMOVAL OF ADDITONAL FOREST ACREAGE AND FOREST ALTERATION AS PRESCRIBED IN THE CULTURAL LANDSCAPE REPORT

VISUAL or AESTHETICS

The proposed alternative will create areas that will be aesthetically unpleasing temporarily until a field environment can be created. No cultural resources, such as trails, cannons or archaeological resources will be damaged. A cultural landscape, reminiscent of the Civil War period, will be created.

WILDLIFE

This alternative would remove up to 20 acres of secondary growth forest habitat. Because much of this habitat lies directly adjacent to the old growth community, it serves as a forested buffer between it and the more disturbed open field habitat upslope. This provides protection to the unique cohort of spring migratory birds residing in the old growth community, as well as providing additional habitat for the rich diversity of herps found adjacent to Boatswain Creek. Removal of the entire 20 acres is likely to impact both the birds and herps. In addition, the removal of the understory in two sections of the old growth forest will create a relatively sterile environment in these areas, and may serve to fragment the old growth habitat into three smaller sections of lesser quality habitat.

The establishment of a 20 acre section of native grass meadow would be likely to increase habitat for field mammals, birds, and reptiles; and would represents a habitat that is now limited in the area.

RARE, THREATENED, OR ENDANGERED SPECIES

This alternative may have adverse effects to the old growth forest community in that it will result in the removal of the forested buffer. This is likely to result in degradation of the community by allowing for the encroachment of invasive species, such as Japanese honeysuckle and Oriental bittersweet.

CULTURAL

The proposed alternative would re-establish up to 20 acres of historic landscape. Care would be taken to prevent damage to cultural resources and would allow archeologists to better access the area.

VISITOR USE

Under this alternative there would be limited disruptive effects to visitors. Tree clearing work would most likely result in the temporary closing of the unit's interpretive trail, however the work would be scheduled for outside of the busy visitation season. Work areas would be patrolled and signed as needed.

ECONOMIC

There would be slight economic environmental consequences. The removal of up to 20 acres of forest and replacement with field habitat would increase the person hours and

equipment required for management. However, this could be minimized by bush hogging only once per year.

AIRSHED

This alternative can have no effect on air quality.

SAFETY

Felling of trees is a concern (see above), but one easily mitigated through the use of professional workers and signage to temporarily close off any dangerous visitor use areas.

SOILS

Techniques would emphasize non-disturbance, including a prohibition of all work activities when more than .25 inches of rain falls in a 24-hour period. Following clearing of trees, field vegetation would be planted as soon as possible including nurse crop to cover the soil until meadow grasses are able to grow. Hay erosion matting would be used where necessary. After several years, forest soils would be replaced by grass field soils.

WATER RESOURCES

All clearing is located up-slope from any wetlands and perennial streams. However, this alternative may include clearing of the headwaters of several intermittent streams. All attempts would be made to minimize soil erosion, and maintain water quality at these sites.

OVERALL PROGRAM RISK

This alternative may present some risk. Erosion would be monitored and mitigated, if needed, and a forested buffer would remain between the clearing and the creek downslope. Human safety concerns will be alleviated. However, fragmentation within the old growth community, and removal of the forested buffer adjacent to it are likely to degrade the habitat and the rich and unique communities it harbors.

IMPAIRMENT

This action is not likely to cause permanent and irreversible damage in any of the above impact topics.

D. REMOVAL OF ADDITIONAL FOREST ACREAGE TO MORE CLOSELY REPLICATE THE HISTORIC SCENE

VISUAL or AESTHETICS

The proposed alternative will create areas that will be aesthetically unpleasing temporarily until a field environment can be created. No cultural resources, such as trails, cannons or

archaeological resources will be damaged. A cultural landscape, reminiscent of the Civil War period, will be created.

WILDLIFE

This alternative would remove up to 20 acres of secondary growth forest habitat. Because much of this habitat lies directly adjacent to the old growth community, it serves as a forested buffer between it and the more disturbed open field habitat upslope. This provides protection to the unique cohort of spring migratory birds residing in the old growth community, as well as providing additional habitat for the rich diversity of herps found adjacent to Boatswain Creek. Removal of the entire 20 acres is likely to impact both the birds and herps.

The establishment of a 20 acre section of native grass meadow would be likely to increase habitat for field mammals, birds, and reptiles; and would represents a habitat that is now limited in the area.

RARE, THREATENED, OR ENDANGERED SPECIES

This alternative may have adverse effects to the old growth forest community in that it will result in the removal of the forested buffer. This is likely to result in degradation of the community by allowing for the encroachment of invasive species, such as Japanese honeysuckle and Oriental bittersweet.

CULTURAL

The proposed alternative would re-establish up to 20 acres of historic landscape. Care would be taken to prevent damage to cultural resources and would allow archeologists to better access the area.

VISITOR USE

Under this alternative there would be limited disruptive effects to visitors. Tree clearing work would most likely result in the temporary closing of the unit's interpretive trail, however the work would be scheduled for outside of the busy visitation season. Work areas would be patrolled and signed as needed.

ECONOMIC

There would be slight economic environmental consequences. The removal of up to 20 acres of forest and replacement with field habitat would increase the person hours and equipment required for management. However, this could be minimized by bush hogging only once per year.

AIRSHED

This alternative can have no effect on air quality.

SAFETY

Felling of trees is a concern (see above), but one easily mitigated through the use of professional workers and signage to temporarily close off any dangerous visitor use areas.

SOILS

Techniques would emphasize non-disturbance, including a prohibition of all work activities when more than .25 inches of rain falls in a 24-hour period. Following clearing of trees, field vegetation would be planted as soon as possible including nurse crop to cover the soil until meadow grasses are able to grow. Hay erosion matting would be used where necessary. After several years, forest soils would be replaced by grass field soils.

WATER RESOURCES

All clearing is located up-slope from any wetlands and perennial streams. However, this alternative may include clearing of the headwaters of several intermittent streams. All attempts would be made to minimize soil erosion, and maintain water quality at these sites.

OVERALL PROGRAM RISK

This alternative may present some risk. Erosion would be monitored and mitigated, if needed, and a forested buffer would remain between the clearing and the creek downslope. Human safety concerns will be alleviated. However, removal of the forested buffer adjacent to the old growth community are likely to degrade the habitat and the rich and unique communities it harbors.

IMPAIRMENT

This action is not likely to cause permanent and irreversible damage in any of the above impact topics.

E. PREFERRED ENVIRONMENTAL ALTERNATIVE

VISUAL or AESTHETICS

The proposed alternative will create areas that will be aesthetically unpleasing temporarily during and immediately following tree clearing. No cultural resources, such as trails, cannons or archaeological resources will be damaged. A landscape, more reminiscent of the Civil War period, will ultimately be created.

WILDLIFE

The proposed alternative will have a small effect on secondary growth forest habitat for small mammals and birds, however such habitat exists in abundance close by. The 200 foot forested buffer to be retained between the old growth forest and the disturbed area will provide protection for the unique bird community, as well as the rich reptile/amphibian community. The establishment of a large, contiguous native grass meadow will increase habitat for field mammals, birds, and reptiles; and represents a habitat that is now non-existent in the area.

RARE, THREATENED, OR ENDANGERED SPECIES

According to a recent inventory of the Gaines' Mill unit, completed by the VA Division of Natural Heritage, the affected area has no known rare, threatened, or endangered (RT&E) species. The habitat proposed for clearing under this alternative is not unique to the area of the park or local community. This alternative also provides a 200 foot buffer from the adjacent old growth community (see above), in order to protect this community from encroaching invasive species.

CULTURAL

The proposed alternative will re-establish up to 7.8 acres of historic landscape as prescribed in the unit's Cultural Landscape Report. Care will be taken to prevent damage to cultural resources and will allow archeologists to better access the area, and stump grinding will only occur to a depth of four inches.

VISITOR USE

Under the proposed alternative there would be limited disruptive effects to visitors as tree clearing will occur adjacent to park trails, however the disruption will be limited to a few days. No throughways will be affected, and visitors will still be able to access the unit.

Tree clearing work will pose little safety concern to visitors as work areas will be patrolled and signed appropriately, and any tree felling concerns will be mitigated through the use of professional tree workers.

ECONOMIC

There will be an increase in the management costs associated with this area once it is cleared, however costs will be minimized by the fact that the resulting area will only be bush hogged once or twice per year.

AIRSHED

Except for an occasional, and temporary, dust cloud from a falling tree, tree clearing will have little effect on air quality.

SAFETY

Felling of trees is a concern (see Visitor Use), but one easily mitigated through the use of professional workers. The affected area will be signed and restricted to visitors as needed.

SOILS

Tree clearing will not occur on areas of erodeable soil, and forested buffers will remain between these areas and those to be cleared. Stumps will be grinded only to a depth of four inches in an effort to minimize soil disturbance. Overall soil disturbance during timber removal will be minimal. Techniques will emphasize non-disturbance, including a prohibition of all work activities when more than .25 inches of rain falls in a 24-hour period. Cleared areas will be re-vegetated as quickly as possible in full native grass coverage.

WATER RESOURCES

Under the proposed alternative, water quality impacts would be minimal or non-existent. All work is located up-slope, on relatively flat terrain, and away from any watercourses, wetlands, or steep ravines. However, the areas of clearing will be quickly reseeded with grasses to avoid soil sedimentation into water courses.

OVERALL PROGRAM RISK

The proposed alternative presents little risk. Erosion and encroachment of invasive species will be monitored and mitigated, if needed. In addition, a large forested buffer will be maintained between the area of clearing and the more unique natural resources found at this unit.

IMPAIRMENT

This action will not cause permanent and irreversible damage in any of the above impact topics. Impairment is not a concern under this alternative.

V. POSSIBLE IMPACT MITIGATING MEASURES FOR THE PROPOSED ACTION

Available inventories of cultural resources will be consulted prior to implementing management activities with possible adverse effects. Only human foot traffic and rubber tread vehicles will be allowed in the work areas. Cultural resources will be protected. Workers will be educated in recognizing cultural resources and in not disturbing them. Known and discovered resources will be marked off-limit. Any and all areas of potential erosion will be matted or similar.

In addition, after the area is cleared, the park would treat the invasive exotic species found in abundance upslope from the old growth community at least once per year. This would

reduce the risk of invasives expanding into this community, therefore increasing the effectiveness of the forested buffer.

VI. CUMULATIVE IMPACTS

Although the park is buffered somewhat by neighboring agricultural fields, increasing surrounding development of homes, roads, strip malls, etc., is rapidly occurring. Forest and agricultural land are being replaced by suburban sprawl. As a result, area soil erosion is increasing, wetland and wild habitat is decreasing, invasive exotic vegetation is increasing, history is being destroyed, and it is becoming increasingly more difficult for the park to tell its story.

At first thought, further removal of any woods, such as proposed, and as completed in the past at this unit, seems to continue the trend. But the 7.8 acre removal of secondary growth timber, even when considered with the three acres previously removed at this unit, is minor in the overall larger picture. Furthermore, the creation of a large, contiguous section of native grass habitat is an environmental benefit to local wildlife populations. Finally, the clearing will enable the park to better meet its mandated goal of telling the story and importance of this unit's historical significance, while still protecting the unique and valuable natural resources known to exist at this unit of the park.

VIII. CONCLUSION

Enacting the preferred action will assist the park in creating an enhanced cultural landscape, which in turn will enable the park to further meet its mandated mission to interpret the actions that occurred on the tract during the Civil War. Visitors will benefit by receiving an increased understanding and knowledge of the strategies and tactics of the battle site.

Enacting the preferred action will not have any significant, negative impacts on the natural environment of the Gaines' Mill unit or adjacent area. The restoration will take place approximately 500 feet away from all wetlands and/or floodplains, and no RT&E species will be affected.

Erosion concerns will be minimized by the use of rubber tired vehicles, not allowing work to occur during rain events or when soil is wet, the placement of erosion control matting when needed, avoiding steep "ravine" areas, and by immediately seeding the affected area with grass as soon as possible after clearing. A suitable nurse crop will be planted to sprout and hold the soil until the desired native grass cover can establish.

Public safety will be maximized by placement of suitable signs and the temporary closing of dangerous work areas (trails).

All Section 106 cultural concerns have been addressed within the Gaines' Mill CLR.

This action is not expected to be controversial. This EA will be advertised to the public for 30 days. There are no known risks or impacts with this project.

VII. COORDINATION AND CONSULTATION

This document will be published in the local newspaper, sent to local, state, and federal agencies, and sent to a variety of individuals or groups having an interest in management of the park. Specific consultations made in the preparation of this document are the following:

Ron Barry, Professor of Biology, Department of Biology, Frostburg State University

Dana Bradshaw, Biologist, Center for Conservation Biology

Shawn Eyring, NEPA Coordinator, NPS Northeast Region

Gary Flemming, Ecologist, Department of Conservation and Recreation, Division of Natural Heritage

J. Chris Ludwig, Chief Biologist, Department of Conservation and Recreation, Division of Natural Heritage

David W. Reynolds, Chief of Resource Management, NPS Northeast Region

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Reviewed by: //s// Michael K. Johnson 9/11/03
Michael K. Johnson Date
Chief Ranger

Approved by: Cynthia MacLeod 9/11/03
Cynthia MacLeod Date
Superintendent

Attachments

Attachment 1 –Map of Richmond National Battlefield Park and the Gaines' Mill Area.

Attachment 2 – USGS Quadrangle map of the Gaines' Mill and surrounding areas, showing perennial streams.

Attachment 3 – Map showing affected area, along with the location of wetlands and the old growth community.

Attachment 4 – Scanned map, from Gaines' Mill CLR, showing full recommended action (i.e. clearing of 20 acres of secondary successional forest, and the thinning of approximately 5 acres of old growth forest).

Contributors

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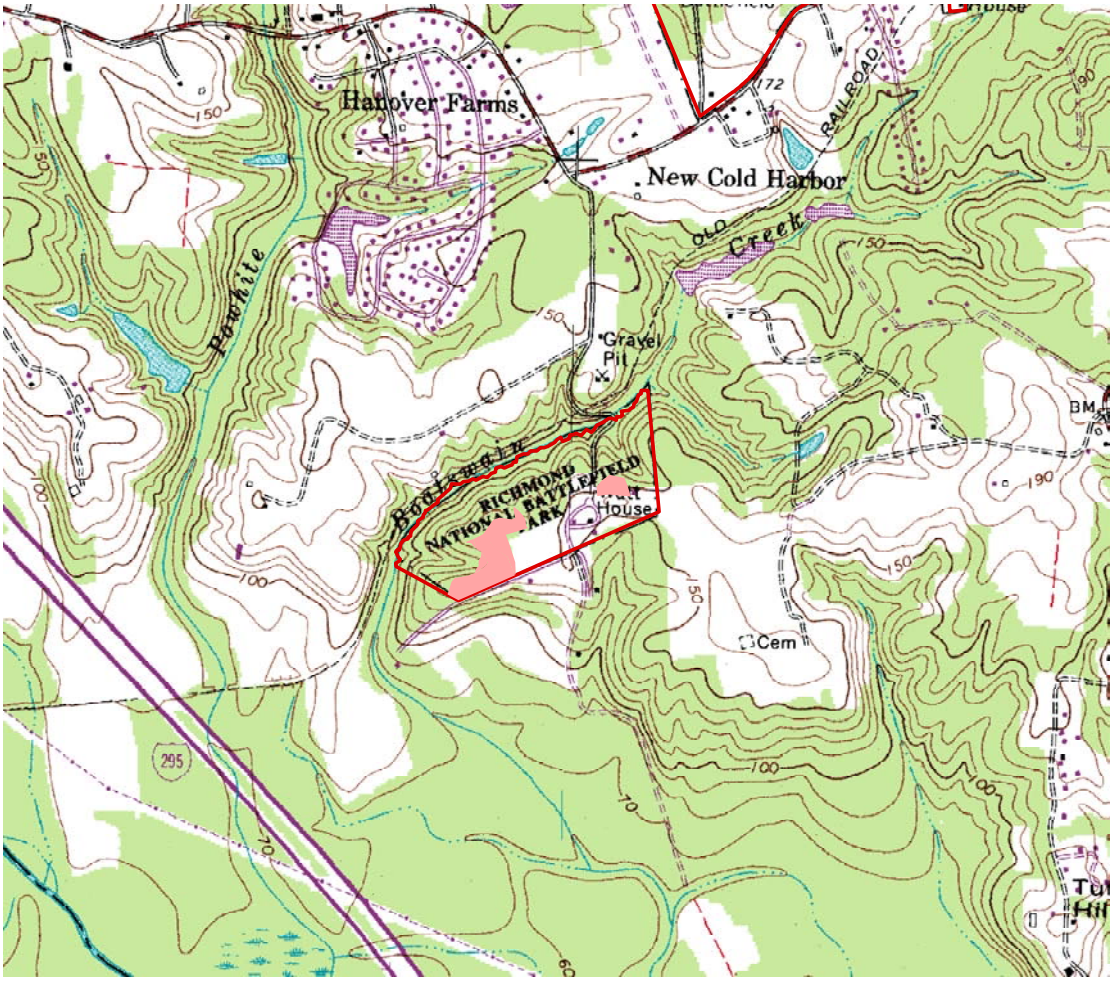
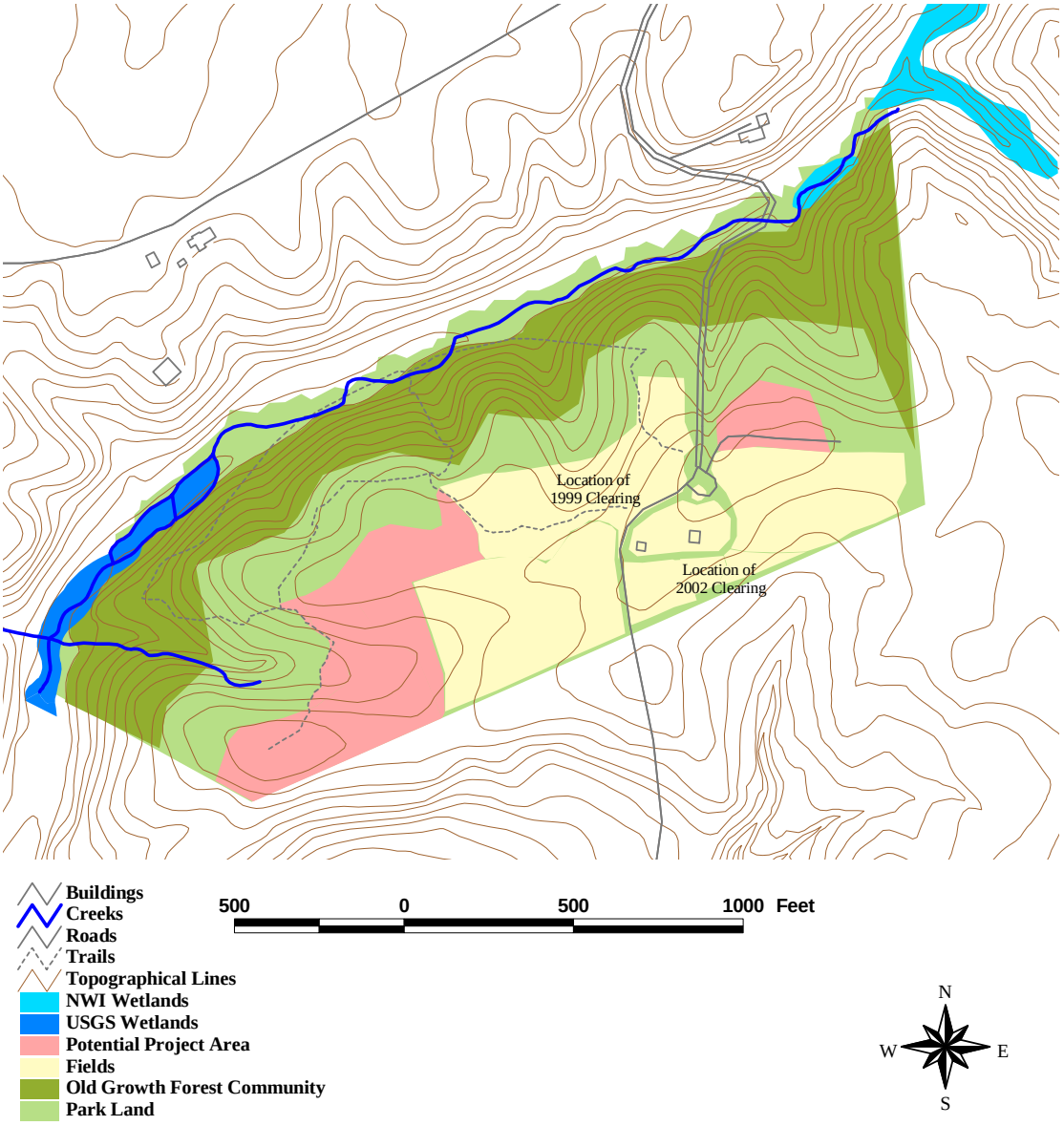
Kristen Gounaris Allen, Natural Resource Management Specialist.

Attachment #2: USGS Quadrangle Map showing Potential Project Areas



Attachment #3: Gaines' Mill unit, showing project area, wetlands, and old growth community



References

Dickinson, Clifford R. 1987. **Historic Landscape Study: Terrain of Gaines' Mill Battlefield June 27, 1862.** Richmond National Battlefield Park. Richmond, VA. 25 pp.

Hayden, W.J., and M.F. Johnson. 1986. **Flora of Richmond National Battlefield [park (Chickahominy Bluffs, Cold Harbor, Fort Darling, Fort Harrison, Garthright House, and Watt House units).** National Park Service, Mid-Atlantic Region Research/Resources Management Report #16. 40 pp.

Helm, A.C., J.E. Johnson, and D. Mitchem. 1993. **Form and Function of Forested Wetlands: Richmond National Battlefield Park,** Virginia. Final Report, Cooperative Agreement #4000-9-8014. Virginia Polytechnic Institute and State University, Blacksburg, VA. 119 pp.

Ludwig, J.C., and C.A. Pague. 1993. **A Natural Heritage Inventory of Mid-Atlantic Region National Parks in Virginia: Richmond National Battlefield Park.** Virginia Department of Conservation and Recreation. Natural Heritage Technical Report #93-12. Cooperative Agreement # 4000-8-8018. Richmond, VA

National Environmental Policy Act (NEPA) of 1969 as amended (40 U.S.C. 4321)

Natural Resources Conservation Service. 2001. **Natural Resources Conservation Plan.**

Richmond National Battlefield Park. 1999. **Gaines' Mill Battlefield Cultural Landscape Report and Archaeological Survey.**

Richmond National Battlefield Park. 1995. **General Management Plan.**

Richmond National Battlefield Park. 1994. **Resources Management Plan.**

USDA, Forest Service. 1984. **Vegetation Analysis and Vegetation Management Considerations for Richmond National Battlefield Park.** Southern Region, Forest Pest Management. Atlanta, GA. 25 pp.

USDA, 1980. **Soil Survey of Hanover County, Virginia.** USDA Soil Conservation Service in Cooperation with Virginia Polytechnic Institute and State University. 217 pp.

U.S. Department of the Interior, U.S. Fish and Wildlife Service. **Endangered Species Bulletin (various).**